

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments, see page 2, filed 1/22/10, with respect to the non-statutory obviousness type double patenting rejection have been fully considered and are persuasive due to applicant filling another Terminal Disclaimer and paying the appropriate fee. The to the non-statutory obviousness type double patenting rejection has been withdrawn.

### **EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Nicholas M. Stabler on 02/24/10.

Claims 1, 3, 7, 8-11 are amended:

1. (Currently amended) An ultra wideband radio transmitter comprising:  
a delay time controller for generating a periodic pulse, inputting the periodic pulse to a first matched filter, outputting the periodic pulse to a second matched filter when transmission data has a first level out of 2 logical levels, outputting the periodic pulse to a third matched filter when the transmission data has a second level out of the 2 logical levels;  
the first matched filter for outputting a reference signal that becomes a data decision criterion when the periodic pulse is input thereto;

the second matched filter for outputting a first data signal a predetermined time ahead of the reference signal when the periodic pulse is input thereto;  
the third matched filter for outputting a second data signal a predetermined time behind the reference signal when the periodic pulse is input thereto;  
an adder for adding up outputs of the first to third matched filters;  
a local oscillator for outputting a local signal for frequency-converting a corresponding addition signal at a high frequency band or a low frequency band;  
a mixer for receiving the addition signal and the local signal, and frequency-converting the corresponding addition signal; and  
an antenna for receiving the frequency-converted addition signal and radiating the ~~corresponding frequency-converted addition~~ signal in the air.

3. (Currently amended) An ultra wideband radio receiver comprising:

an antenna for receiving a radio wave signal;  
a local oscillator for outputting a local signal for frequency-converting the radio wave signal;  
a mixer for receiving the radio wave signal and the local signal, and frequency-converting the radio wave signal;  
a first matched filter for receiving the frequency-converted radio wave signal, and outputting a first output signal when a reference signal that becomes a data decision criterion is detected therefrom;

a second matched filter for receiving the frequency-converted radio wave signal, and outputting a second output signal when a data signal is detected therefrom;

a delay time measurer for detecting which of the first output signal and the second output signal has been first output from the first and second matched filters, and outputting a corresponding detection result; and

a data decider for receiving the detection result and deciding whether the data signal has a first level or a second level out of 2 logical levels,

wherein the delay time measurer comprises a first circuit for receiving the first output signal and calculating a square value or an absolute value of the first output signal, a second circuit for receiving the second output signal and calculating a square value or an absolute value of the second output signal, a first latch for receiving and setting a an output signal of the first circuit, a second latch for receiving and setting a an output signal of the second circuit, a first memory for reading a an output signal of the second latch as the detection result by receiving a output signal of the first latch, a second memory for reading the output signal of the first latch as the detection result by receiving the output signal of the second latch, and a reset section for outputting a reset signal by receiving outputs of the first and second latches.

7. (Currently amended) An ultra wideband radio transmitter including a first radio section for performing data communication using a first frequency, a second radio section for performing data communication using a second frequency being different from the first frequency, and an interface section for allocating transmission data to the first and second radio sections, the transmitter comprising:

the first radio section including[[];[]]

a first delay time controller for generating a periodic pulse by receiving transmission data allocated by the interface, inputting the periodic pulse to a first matched filter, outputting the periodic pulse to a second matched filter when the transmission data has a first level out of 2 logical levels, and outputting the periodic pulse to a third matched filter when the transmission data has a second level out of the 2 logical levels[[];[]],

the first matched filter for outputting a reference signal that becomes a data decision criterion when the periodic pulse is input thereto[[];[]],

the second matched filter for outputting a first data signal a predetermined time ahead of the reference signal when the periodic signal is input thereto;

the third matched filter for outputting a second data signal a predetermined time behind the reference signal when the periodic pulse is input thereto[[];[]], and

a first adder for adding up outputs of the first to third matched filters; and a first antenna for receiving a corresponding addition signal and radiating the addition signal in the air; and the second radio section including[[];[]]

a second delay time controller for generating a periodic pulse by receiving transmission data allocated by the interface, inputting the periodic pulse to a fourth matched filter, outputting the periodic pulse to a fifth matched filter when the transmission data has a first level out of 2 logical levels, and outputting the periodic pulse to a sixth matched filter when the transmission data has a second level out of the 2 logical levels[[];[]],

the fourth matched filter for outputting a reference signal that becomes a data decision criterion when the periodic pulse is input thereto[[];[]],

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the fifth matched filter for outputting a first data signal a predetermined time ahead of the reference signal when the periodic signal is input thereto[;],

the sixth matched filter for outputting a second data signal a predetermined time behind the reference signal when the periodic pulse is input thereto[;],

a second adder for adding up outputs of the ~~third to fifth~~ fourth to sixth matched filters[;],

a local oscillator for outputting a local signal for frequency-converting a corresponding addition signal ~~from the first frequency to the second frequency~~ of the second adder[;],

a mixer for receiving the addition signal and the local signal, and frequency-converting the addition signal[;], and

an antenna for receiving the frequency-converted addition signal and radiating the ~~corresponding frequency-converted addition~~ signal in the air.

8. (Currently amended) An ultra wideband radio receiver including a first radio section for performing data communication using a first frequency and a second radio section for performing data communication using a second frequency being different from the first frequency, the receiver comprising:

a first antenna for receiving a radio wave signal and outputting the received radio wave signal to a first matched filter and a second matched filter;

the first matched filter for receiving a signal from the first antenna, and outputting a first output signal when a reference signal that becomes a data decision criterion is detected therefrom;

the second matched filter for receiving a signal from the first antenna, and outputting a second output signal when a data signal is detected therefrom;

a first delay time measurer for detecting which of the first output signal and the second output signal has been first output from the first and second matched filters, and outputting a corresponding detecting result; and

a first data decider for receiving the detection result, and deciding whether the data signal has a first level or a second level out of 2 logical levels; and  
the second radio section including[;];

a second antenna for receiving a radio wave signal[;];

a local oscillator for outputting a local signal for frequency-converting the radio wave signal[;];

a mixer for receiving the radio wave signal and the local signal, and frequency-converting the radio wave signal[;];

a third matched filter for receiving the frequency-converted radio wave signal, and outputting the first a third output signal when a reference signal that becomes a data decision criterion is detected therefrom[;];

a fourth matched filter for receiving the frequency-converted radio wave signal, and outputting the second a fourth output signal when a data signal is detected therefrom[;];

a second delay time measurer for detecting which of the first third output signal and the second fourth output signal has first been output from the third and fourth matched filters, and outputting a corresponding detection result[;]; and

a second data decider for receiving the detecting result, and deciding whether the data signal has a first level or a second level out of 2 logical levels,

wherein the first ~~or second~~ delay time measurer comprises a first circuit for receiving the first output signal and calculating a square value or an absolute value of the first output signal, a second circuit for receiving the second output signal and calculating a square value or an absolute value of the second output signal, a first latch for receiving and setting a output signal of the first circuit, a second latch for receiving and setting a output signal of the second circuit, a first memory for reading a output signal of the second latch as the detection result by receiving a output signal of the first latch, a second memory for reading the output signal of the first latch as the detection result by receiving the output signal of the second latch, and a reset section for outputting a reset signal by receiving outputs of the first and second latches.

9. (Currently amended) An ultra wideband radio transmitter including a first radio section for performing data communication using a first frequency, a second radio section for performing data communication using a second frequency being different from the first frequency, and an interface for allocating transmission data to the first and second radio sections, the transmitter comprising:  
the first radio section including{[,]}

a first delay time controller for generating a periodic pulse by receiving transmission data allocated by the interface, inputting the periodic pulse to a first matched filter, outputting the periodic pulse to a second matched filter when the transmission data has a first level out of 2 logical levels, and outputting the periodic pulse to a third matched filter when the transmission

data has a second level of the 2 logical levels{[;]},

the first matched filter for outputting a reference signal that becomes a data decision criterion when the periodic pulse is input thereto{[;]},

the second matched filter for outputting a first data signal a predetermined time ahead of the reference signal when the periodic pulse is input thereto{[;]},

the third matched filter for outputting a second data signal a predetermined time behind the reference signal when the periodic pulse is input thereto{[;]},

a first adder for adding up outputs of the first to third matched filters{[;]}, and

a first antenna for receiving a corresponding addition signal, and radiating the addition signal in the air; and

the second radio section including{[;]}

a second delay time controller for generating a periodic pulse by receiving transmission data allocated by the interface, inputting the periodic pulse to a fourth matched filter, outputting the periodic pulse to a fifth matched filter when the transmission data has a first level out of 2 logical levels, and outputting the periodic pulse to a sixth matched filter when the transmission data has a second level of the 2 logical levels{[;]},

the fourth matched filter for outputting a reference signal that becomes a data decision criterion when the periodic pulse is input thereto{[;]},

the fifth matched filter for outputting a first data signal a predetermined time ahead of the reference signal when the periodic pulse is input thereto{[;]},

the sixth matched filter for outputting a second data signal a predetermined time behind the reference signal when the periodic pulse is input thereto{[;]},

a second adder for adding up outputs of the ~~third to fifth~~ fourth to sixth matched filters~~[[,]]~~.

a local oscillator for outputting a local signal for frequency-converting a corresponding addition signal ~~of the second adder~~ from the first frequency to the second frequency~~[[,]]~~, and a mixer for receiving the addition signal and the local signal, frequency-converting the addition signal, and outputting the frequency-converted addition signal to the first antenna.

10. (Currently amended) An ultra wideband radio receiver including a first radio section for performing data communication using a first frequency and a second radio section for performing data communication using a second frequency being different from the first frequency, the receiver comprising:

a first antenna for receiving a radio wave signal and outputting the received radio wave signal to a first matched filter, a second matched filter, and a mixer in the second radio section; the first matched filter for receiving a signal from the first antenna, and outputting a first output signal when a reference signal that becomes a data decision criterion is detected therefrom;

the second matched filter for receiving a signal from the first antenna, and outputting a second output signal when a data signal is detected therefrom;

a first delay time measurer for detecting which of the first output signal and the second output signal has been first output from the first and second matched filters, and outputting a corresponding detecting result; ~~and~~

a first data decider for receiving the detection result, and deciding whether the data signal

has a first level or a second level out of 2 logical levels; and

the second radio section including[;];

a local oscillator for outputting a local signal for frequency-converting a radio wave signal received from the first antenna[;];

a mixer for receiving the radio wave signal from the first antenna and the local signal, and frequency-converting the radio wave signal[;];

a third matched filter for receiving the frequency-converted radio wave signal, and outputting ~~the first~~ a third output signal when a reference signal that becomes a data decision criterion is detected therefrom[;];

a fourth matched filter for receiving the frequency-converted radio wave signal, and outputting ~~the second~~ a fourth output signal when a data signal is detected therefrom[;];

a second delay time measurer for detecting which of the ~~first~~ third output signal and the ~~second~~ fourth output signal has first been output from the third and fourth matched filters, and outputting a corresponding detection result[;]; and

a second data decider for receiving the detecting result, and deciding whether the data signal has a first level or a second level out of 2 logical levels,

wherein the ~~first or second~~ delay time measurer comprises a first circuit for receiving the first output signal and calculating a square value or an absolute value of the first output signal, a second circuit for receiving the second output signal and calculating a square value or an absolute value of the second output signal, a first latch for receiving and setting a output signal of the first circuit, a second latch for receiving and setting a output signal of the second circuit, a

first memory for reading a output signal of the second latch as the detection result by receiving a output signal of the first latch, a second memory for reading the output signal of the first latch as the detection result by receiving the output signal of the second latch, and a reset section for outputting a reset signal by receiving outputs of the first and second latches.

11. (Currently amended) An ultra wideband radio communication ~~system method~~ characterized in that in an ultra wideband radio transmitter, comprising:  
a delay time controller which generates a periodic pulse, inputs the periodic pulse to a first matched filter, outputs the periodic pulse to a second matched filter when transmission data has a first level out of 2 logical levels, and outputs the periodic pulse to a third matched filter when the transmission data has a second level out of 2 logical levels;  
the first matched filter which outputs a reference signal that becomes a data decision criterion when the periodic pulse is input thereto;  
the second matched filter which outputs a first data signal a predetermined time ahead of the reference signal when the periodic pulse is input thereto;  
the third matched filter which outputs a second data signal a predetermined time behind the reference signal when the periodic pulse is input thereto;  
an adder which adds up outputs of the first to third matched filters;  
a local oscillator which outputs a local signal for frequency-converting a corresponding addition signal at a high frequency band or a low frequency band;  
a mixer which receives the addition signal and the local signal, and frequency-converts the addition signal; and

an antenna which receives the frequency-converted addition signal, and radiates the corresponding signal in the air; and in

an ultra wideband radio receiver, comprises an antenna which receives ~~the addition a~~ radio wave signal and outputs the corresponding signal to a second mixer;

the second mixer which receives ~~the addition a radio wave~~ signal and a local signal that a local oscillator outputs to frequency-convert ~~the addition~~ the radio wave signal, and frequency-converts the addition signal;

a fourth matched filter which receives the frequency-converted radio wave signal, and outputs a first output signal when a reference signal that becomes a data decision criterion is detected therefrom;

a fifth matched filter which receives the frequency-converted radio wave signal, and outputs a second output signal when a data signal is detected therefrom;

a delay time measurer which detects which of the first output signal and the second output signal has been first output from the fourth and fifth matched filters, and outputs a corresponding detection result; and

a data decider which receives the detection result, and decides whether the data signal has a first level or a second level out of 2 logical levels,

wherein the delay time measurer comprises a first circuit for receiving the first output signal and calculating a square value or an absolute value of the first output signal, a second circuit for receiving the second output signal and calculating a square value or an absolute value of the second output signal, a first latch for receiving and setting a an output signal of the first circuit, a second latch for receiving and setting a ~~an~~ output signal of the second circuit, a first

memory for reading a an output signal of the second latch as the detection result by receiving a an output signal of the first latch, a second memory for reading the output signal of the first latch as the detection result by receiving the output signal of the second latch, and a reset section for outputting a reset signal by receiving outputs of the first and second latches.

***Allowable Subject Matter***

2. Claims 1-4 and 7-11 are allowed. Due to the proper filling of the terminal disclaimer and fee is paid. Claims 5-6 have been cancelled.

***Terminal Disclaimer***

3. The terminal disclaimer filed on 01/22/10 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent number (7,359,425) has been reviewed and is accepted. The terminal disclaimer has been recorded.

***Reason for Allowance***

4. The following is an examiner's statement of reasons for allowance: The applicant discloses an Ultra-wide band system which contains first, second and third match filters which are used to output at a predetermined time ahead of a reference signal when receiving the pulses. Then adding the outputs of the first to third match filters and up-converting the output for transmission. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid

processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SANTIAGO GARCIA whose telephone number is (571)270-5182. The examiner can normally be reached on MONDAY- FRIDAY 7:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SG/

/CHIEH M FAN/

Supervisory Patent Examiner, Art Unit 2611